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How to cite:

Ison, Ray and Shelley, Monica (2016). Governing in the Anthropocene: Contributions from Systems Thinking in Practice? *Systems Research and Behavioral Science*, 33(5) pp. 589–594.

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Version: Accepted Manuscript

Link(s) to article on publisher's website:

<http://dx.doi.org/doi:10.1002/sres.2436>

[http://onlinelibrary.wiley.com/journal/10.1002/\(ISSN\)1099-1743a](http://onlinelibrary.wiley.com/journal/10.1002/(ISSN)1099-1743a)

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Editorial

Governing in the Anthropocene: Contributions from Systems Thinking in Practice?

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In his recent book *‘Learning to Die in the Anthropocene. Reflections on the End of Civilization’* Roy Scranton (2015) concludes with the observation ‘we [humans] can practice and cultivate understanding the intimate, necessary connection of all things to each other’ (p. 117). This reflection speaks to a systemic sensibility that is available to all humans, but which unfortunately seems absent in the understandings and actions of many (Figure 1). The extent of this absence and the degree to which it is cultural is an open question. The good news, based on over 40 years of experience in offering systems education at The Open University (UK), is that despite our culture and institutions (norms, or rules of the ‘human game’) a certain percentage of us retain a systemic sensibility – something which we may have been born with, or which developed in childhood. What is missing, however, are the contexts for a systemic sensibility to flourish, to be recovered and/or fostered. Investment in building systems literacy and then system thinking in practice capability (Figure 1) is missing in education as well as organisational life. The shift from sensibility to capability is needed if purposeful action is to be pursued with some prospect of altering the current and anticipated human condition, our co-evolutionary trajectory with the biophysical world, with other species and with each other. This is the challenge of ‘Governing in the Anthropocene’ which, as a profoundly existential crisis, is also the greatest challenge for systems thinking in practice, or those who would argue that part of the trajectory altering action is greater investment in thinking and acting systemically.

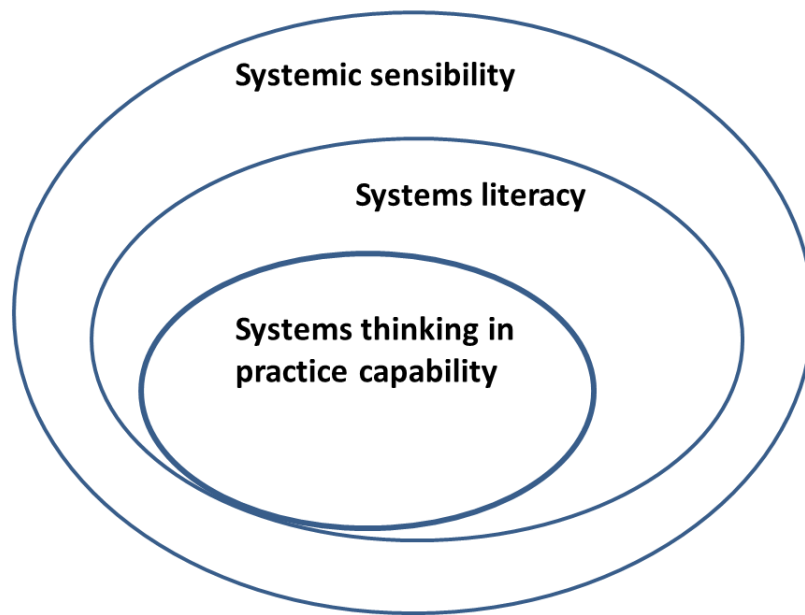


Figure 1. The nested (systemic) relationship between systemic sensibility, systems literacy and systems thinking in practice capability.

As Ison (2010) argued: ‘the acceptance that humans are changing the climate of the earth is the most compelling, amongst a long litany of reasons, as to why we have to change our ways of thinking and acting. Few now question that we have to be capable of adapting quickly as new and uncertain circumstances emerge and that this capability will need to exist at the personal, group, community, regional, national and international levels all at the same time.’ (p. 3).

At this important historical moment when consciousness of the predicament we humans are in is at last gaining traction, there is a need to appreciate what we can learn from our past that will be helpful as well as to understand what needs to be abandoned because it is now irrelevant. Because the phenomenon of human-induced climate change is new to human history it follows that many past and current ways of thinking and acting are unlikely to be helpful. Scranton (2015 p. 27) points to a clear choice: ‘We can continue acting as if tomorrow will be just like yesterday, growing less and less prepared for each new disaster as it comes, and more and more desperately invested in a life we can’t sustain. Or we can learn to see each day as the death of what became before, freeing ourselves to deal with whatever problems the present offers without attachment or fear’.

This special issue is premised on a conviction that development of our capabilities to think and act systemically is an urgent priority: ‘Systems thinking and practice are not new but individually and socially our capability to use and do it is very limited. Unfortunately these are not abilities developed universally through schooling or at University. In the latter, the rise of specialised subject matter disciplines, the focus on science and technology at the expense of praxis (theory informed practical action), and reductionist research approaches have driven the intellectual and practical field of Systems , a form of trans-disciplinary or ‘meta’ thinking, from the curriculum.’ (Ison 2010 p.4).

The prevailing paradigm in the governance of the relationship between humans and the biophysical world is characterised by commitments to scientism and linear, causal and dualistic thinking. Currently governance, if understood as enacting cyber-systemic processes that maintain the quality of relationships between humans and the biosphere, can be seen to be failing on many fronts. The Anthropocene has emerged as a conceptual framing for this issue, but to date little cyber-systemic understanding and praxis has meaningfully informed the unfolding discourse. Similar framings and arguments are mounted by Pope Francis in his Encyclical Letter, ‘Laudato si’ ‘On care for our common home’ (The Holy See 2015).

As noted by the Working Group on the 'Anthropocene' human impacts on the Earth include changes in:

- “erosion and sediment transport associated with a variety of anthropogenic processes, including colonisation, agriculture, urbanisation and global warming;
- the chemical composition of the atmosphere, oceans and soils, with significant anthropogenic perturbations of the cycles of elements such as carbon, nitrogen, phosphorus and various metals;
- environmental conditions generated by these perturbations [including] global warming, ocean acidification and spreading oceanic 'dead zones';
- the biosphere both on land and in the sea, as a result of habitat loss, predation, species invasions and the physical and chemical changes noted above” (see <http://quaternary.stratigraphy.org/workinggroups/anthropocene/> Accessed 6th June, 2016).

The “‘Anthropocene’ is currently being considered by the Working Group as a potential geological epoch, i.e. at the same hierarchical level as the Pleistocene and Holocene epochs, with the implication that it is within the Quaternary Period, but that the Holocene has

terminated”. The “‘Anthropocene’ [classification] is being developed by the ‘Anthropocene’ Working Group for consideration by the International Commission on Stratigraphy, with a current target date of 2016” (*ibid*).

Regardless of whether one accepts or likes the framing offered by the neologism ‘Anthropocene’ it is clear that the phenomena to which it refers are ‘real’ and in need of transformations in our individual and collective understandings and practices. The extent to which this will include systems and cybernetics (cybersystemic) understandings and practices is the focus of an inquiry begun at Herrenhausen Palace in July 2015 and continued as the organising theme of ISSS2015 in Berlin in August 2015 (see http://issss.org/world/Berlin_2015 Accessed 17th August 2016)ⁱ, the 59th meeting of the International Society for the Systems Sciences (ISSS). Critically exploring the case for re-engaging with and re-vitalising cyber-systemic thinking and practice, as an important opportunity we humans have, is the focus of this Special Issue which also functions as the 2016 ISSS yearbook.

The inquiry begun in Germany in 2015 was formulated in the desire to start out in an emotion of hope and with some optimism by going beyond a reiteration of problems to propose some next steps. The inquiry, and this special issue, were designed to put on display the possibilities that cybersystemic theories and practices offer to meet the challenges of the Anthropocene – of contributing to steering, or governing, viable trajectories of living in the Anthropocene. What was begun in Germany and is continued here needs to be ongoing; through this collection of papers we seek to challenge cybersystemic thinkers, researchers, practitioners and scientists to reflect upon what they do, or might do, in responding to the challenges of governing in the Anthropocene.

The selection of papers that make up this special issue reflect the design of ISSS2015 in Berlin as well as some presentations from the associated Herrenhausen event (see <http://www.open.ac.uk/blogs/govan/> Accessed 17th August 2016). The special issue is organised in three parts. Following this editorial are five research papers followed by two invited ‘commentaries’ based on talks presented in Germany in 2015. The final section comprises two research notes; these provide overviews of the research of two of the three student award winners for best papers presented at ISSS2015.

Research papers

Ison's paper, *Governing in the Anthropocene: what future systems thinking in practice?* is firmly orientated towards the future, and what institutional forms, governance reform and praxis innovations would be capable – and seen to be capable – of responding to, and in the Anthropocene. He begins by discussing the importance of framing choice, whether done consciously or not, and how being open to the Anthropocene as a framing choice, supported as appropriate by metaphor theory and practice, is a sensible strategy. He goes on to analyse three conceptual pathway dependencies: governance or governing, practice or practising and systems including the systems sciences. To illustrate and bring together the ideas he advances, a research case study, CADWAGO (see ??), is described. This aimed to address the global challenge of water security by enabling appropriate responses to the impacts of climate change on water resources. He concludes by suggesting that future systems research might be defined as the search for effective 'imaginaries' which would offer fresh possibilities within an Anthropocene setting. Whilst both positive and optimistic about what cybersystemic thinking and practice can contribute in future he poses several challenges to systems scholars and organisations that from his perspective must be addressed.

In Martin Bunch's paper, *Ecosystem Approaches to Health and Well-being*, the principles he elucidates and the examples given demonstrate very clearly how community health and well-being can be supported and improved by the use of systems practice and approaches. The ecohealth approach, which links population or community health and wellbeing with the environment and sustainable development, is based on the understanding that health outcomes emerge from interrelationships within socio-ecological systems. Bunch provides three case studies which are exceptionally varied in location, community and content.

The first two papers explicitly adopt a framing for governing that involves an evolving dynamic between the social and biophysical domains, something that is missing from most current governance institutions and the practices of those concerned with governing. Together these two papers highlight the importance of systemic framings of situations, the coupled, co-evolutionary nature of the social and the biophysical, and highlight the importance of being open to different modes of practice. They provide a setting for the next three papers which look closely at modelling, project management and systemic evaluation, each vitally important areas of practice in need of cybersystemic understanding and enactment.

“Till the muddle in my mind have cleared awa”: can we help shape policy using systems modelling? is the intriguing title of the next paper, by David Lane. He concentrates on the

technique of systems modelling, analysing it and suggesting possible uses. Lane first offers a sample of systems modelling tools, indicating what they might offer to policy discussions in the Anthropocene. He highlights the problems associated with complexity and the need to understand unintended consequences and feedback. To illustrate potential problem areas, he draws on examples from fishery management and the possibilities of misreading the physical abuse of a child. He then looks forward to suggest what might be needed to use those tools in practical situations, listing possible levers for successful implementation.

Louis Klein's paper, entitled *Towards a practice of systemic change: acknowledging social complexity in project management* urges the need for systemic change, and how this might work in the context of project management. He identifies the need to acknowledge social complexity and suggests how to identify its sources. There is a wide range of challenges involved in project management, and Klein works through them, suggesting alternative approaches – some radical, some based in existing practice. He concludes by proposing the idea of Next Practice as a key for change and project management.

Reynolds, Gates, Hummelbrunner, Marra and Williams are the joint authors of *Towards systemic evaluation*. This paper presents, through five different but related voices, and thus perspectives, insights and issues from the emerging network of systemic evaluation practitioners and scholars. The paper begins by identifying the problems associated with conventional evaluation models. A viable alternative is offered by systemic evaluation (STCS: systems thinking and complexity science) – an important concept which is described and analysed. Reynolds sums up the value of the technique in different settings, concluding, on the basis of his colleagues' experience, that systemic evaluation can be used to depict 'natural' systems, human-made artefactual systems and human-enacted systems.

Commentaries

Both commentaries represent the personal views of the two authors and both focus on interdependence as a central feature of governing in the Anthropocene.

Mary Catherine Bateson's commentary, *The Myths of Independence and Competition*, takes a very personal approach to her discussion of individual independence and its dangers. She speaks passionately about the need to establish interdependence within communities, countries and worldwide.

Noam Cook's commentary, *A Delicate Balance: the interdependence of natural, artefactual and human systems*, picks up on the systems summarised by Reynolds in the earlier paper, spelling out their function, as he understands it, within the Anthropocene. To illustrate his thesis that governance in the Anthropocene requires ways of thinking and acting that contribute to the stability and sustainability of these systems and their interdependence, he offers two examples of current water projects in Singapore and California.

Research Notesⁱⁱ

Alexandre Strapasson's research note is entitled *Modelling the limits of bioenergy*. It demonstrates the importance of bioenergy, examples of which are solid biomass, biofuels and biogas, in offering a useful perspective for discussing land use strategies and climate change mitigation. Strapasson offers a model for the main dynamics of bioenergy, but also points out that there are limits to its use. Alexandre was the winner of The Sir Geoffrey Vickers Memorial Award at ISSS2015 (see http://issss.org/world/Student_Awards)

Educating and empowering children for governing the Anthropocene: a case study of children's homes in Sri Lanka is the title of the final paper in this special issue, from Eshantha Ariyadasa. The three case studies described here show how educating children in environmental good practice will help them to protect their environment in the future. Eshantha was the winner of The Margaret Mead Memorial Award at ISSS2015 (see http://issss.org/world/Student_Awards).

Final Reflections

Engaging with the concept and consequences of the Anthropocene brings to the forefront the challenge of how we humans govern ourselves i.e., how we respond to and act in relation to the biophysical world, other species and amongst ourselves. Discourses, practices and institutional innovations associated with cybernetic and systems thinking and practice remain sublimated in our governance arrangements (as the Limits to Growth experience testifies – see Meadows et al 1972) but an historical moment may be upon us to explore and, where relevant, strengthen the ways of thinking, acting and governing that cybersystemics offers? There is significant institutional fragmentation within the cybersystemics field and since the very significant Macy Conferences 1941-60 (also partially organised around cybersystemics – see Hammond 2003) few attempts to create new opportunities to revitalise the field. Since the exercise in cross-disciplinary synthesis that was undertaken within the Macy Conferences new, important disciplines and sub-disciplines have emerged. One important example is

institutional economics, that branch of economics devoted to institutional analysis and innovation in relation to governing social-ecological systems. This field will be very important if understandings from earlier important works such as ‘Limits to Growth’ are to lead to systemic innovations able to contribute to governance reform.

Concurrently with an Anthropocene-framing of our circumstances global conversations conducive to systemic change are emerging; these include:

- (i) The Circular Economy (see <https://www.theguardian.com/sustainable-business/10-things-need-to-know-circular-economy> Accessed 19th August 2016)
- (ii) Polycentric and/or systemic governance (see https://en.wikipedia.org/wiki/Multi-level_governance Accessed 19th August 2016)
- (iii) Sustainable Development Goals – to replace the Millennium Development Goals (see <http://www.un.org/sustainabledevelopment/sustainable-development-goals/> Accessed 19th August 2016);
- (iv) Resilience and transformation (see <http://www.resalliance.org/> Accessed 19th August 2016);
- (v) Planetary Boundaries (see https://en.wikipedia.org/wiki/Planetary_boundaries Accessed 19th August 2016)
- (vi) Future Earth (see <http://www.icsu.org/future-earth> Accessed 19th August 2016).

Importantly these discourses are refuting the classic model of sustainable development, of three integrated pillars — economic, social and environmental — that has served nations and the UN for over several decades. Distressingly understandings of cybersystemics within these initiatives, where they exist, seem weak or inadequate. This is a situation that needs to change – this volume is one contribution in that process.

Acknowledgements

Our thanks are extended to all authors who responded to the invitation of RLI to contribute to this special issue/yearbook. We should like to thank all those referees who gave their time and energy to reading and commenting on the drafts of these papers. Their contributions have been invaluable. We thank Mike Jackson and the staff at Wiley for their advice and support.

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ⁱ Conference co-hosts were Ray Ison (ISSS President) and Louis Klein (ISSS Vice President for Conferences) - held in Berlin from the 2nd-7th August 2015

ⁱⁱ Kwamina Ewur Banson was the third of the award recipients at ISSS2015 and winner of the Anatol Rapoport Memorial Award. Time demands associated with his PhD completion requirements meant he was unable to contribute to this issue.